

Claims

[c1] What is claimed is:

1. A system for providing auxiliary power from an engine comprising:

at least one auxiliary component disposed within a recreational product and configured to be powered by a rated voltage within a rated voltage range;

an engine in operable association with the recreational product and configured to supply an internal rail voltage substantially greater than the rated voltage range; and
a converter system configured to convert the internal rail voltage to supply the at least one auxiliary component with the rated voltage.

[c2] 2. The system of claim 1 wherein the recreational product is one of an outboard motor, a watercraft, an all-terrain vehicle, motorcycle, a scooter, a snowmobile, and a lawn and garden equipment.

[c3] 3. The system of claim 1 further comprising a switching regulator to convert AC power from the combustion engine to DC power for the internal rail.

[c4] 4. The system of claim 1 wherein the converter system

includes a buck converter to regulate the internal rail voltage to supply the at least one auxiliary component with the rated voltage.

[c5] 5. The system of claim 4 wherein the buck converter includes at least one discrete switch and a pulse width modulation control circuit configured to control the discrete switch to convert internal rail voltage to the rated voltage.

[c6] 6. The system of claim 5 wherein the buck converter includes at least one inductive component configured to receive the rated voltage from the at least one discrete switch and regulate the rated voltage to stay within the rated voltage range.

[c7] 7. The system of claim 1 wherein the internal rail voltage includes a voltage of greater than 36 volts DC.

[c8] 8. The system of claim 1 wherein the combustion engine is a two-stroke engine.

[c9] 9. The system of claim 1 wherein the at least one auxiliary component includes a first battery configured to start the combustion engine.

[c10] 10. The system of claim 9 wherein the at least one auxiliary component includes a second battery.

- [c11] 11. The system of claim 1 wherein the at least one auxiliary component includes accessories of the recreational product.
- [c12] 12. The system of claim 11 wherein the accessories of the recreational product include at least one of a light, a radios, a CD player, a DVD players, and a television.
- [c13] 13. The system of claim 1 wherein the engine is a battery-less engine.
- [c14] 14. A method of powering a recreational product accessory comprising the steps of:
generating an AC power with an engine of a recreational product;
converting the AC power to a DC power that includes a substantially greater voltage than an operational voltage range of an accessory of the recreational product;
supplying the DC power to an internal rail of the engine;
receiving the DC power from the internal rail; and
regulating the DC power received from the internal rail to deliver an operational voltage within the operational voltage range.
- [c15] 15. The method of claim 14 wherein the DC power is includes at voltage level that would damage the accessory of the recreational product if supplied thereto.

- [c16] 16. The method of claim 14 further comprising the step of delivering a charging voltage from the operational voltage to a battery configuration to charge the battery configuration.
- [c17] 17. The method of claim 16 wherein the battery configuration includes at least one battery connected to start an outboard motor.
- [c18] 18. The method of claim 16 wherein the battery configuration includes at least a second battery not connected to start the outboard motor.
- [c19] 19. The method of claim 14 wherein the step of regulating the internal rail power includes pulse width modulating a discrete switch to deliver the operational voltage.
- [c20] 20. An outboard motor comprising:
a powerhead having a combustion engine, a midsection configured for mounting the outboard motor to a watercraft, and a lower unit powered by the combustion engine to propel a watercraft;
at least one battery only operable within a battery charging range and connected to provide starting power to the combustion engine;
a converter connected to the combustion engine and configured to convert AC power supplied by the com-

bustion engine to a DC power includes a voltage that is above the battery charging range; and
a regulator connected to the converter and configured to adjust the DC power to supply voltage within the battery charging range to the at least one battery.

[c21] 21. The outboard motor of claim 20 wherein the regulator is configured to receive the DC power from an internal rail of the outboard motor.

[c22] 22. The outboard motor of claim 20 wherein the DC power includes a voltage greater than 36 volts DC and the battery charging range is 10–18 volts DC.

[c23] 23. The outboard motor of claim 20 wherein the at least one battery includes at least a first battery configured to start the outboard motor and a second battery configured only for auxiliary equipment and wherein the first and the second batteries are electrically isolated.

[c24] 24. The outboard motor of claim 20 wherein the regulator includes a buck converter connected to the at least one battery and configured to adjust the DC power to provide a voltage within the battery charging range.

[c25] 25. The outboard motor of claim 20 wherein regulator is a switching regulator configured to switch an alternator winding configuration to and from at least two of a se–

ries configuration, a parallel configuration, and a combination of series and parallel configuration.

- [c26] 26. The outboard motor of claim 20 further comprising a multi-coil alternator connected between the combustion engine and the converter and configured to be driven by the combustion engine to generate the AC power.
- [c27] 27. The outboard motor of claim 20 wherein regulator is further configured to adjust the DC power to supply voltage within an operational range of at least one accessory external to the outboard motor to power the at least one accessory.